

use, solely as a means for friends and family around the world to stay in touch. The purpose of this project is to prove to the world that it can be done.

The first stage of this experiment will enable users of the Internet and Internet telephony software to dial out to regular phones. In the future, "dial-in capability" may also be added. This would allow people to call into this system and around the world from any touch-tone telephone, creating a seamless system where users on both sides don't need to have the Internet or a computer.

2. How did this Project get Started?

Well, Internet Phone enthusiasts have been toying with the idea in a group forum for months, on the iphone mailing list moderated by Jeffrey Pulver (jeff@pulver.com), but it was in mid-October that Izak Jenie in Jakarta and Steven Mercurio in New Jersey sparked widespread interest in launching this experiment when they announced that they were working on implementations of the Internet-to-telephone patch.

Brandon Lucas in Tokyo crystallized interest in this project on October 17th, 1995 with a posting about monopolies and high communications prices.

Within hours of that posting, the response grew so strong that Jeff Pulver (iphone list administrator and noted advocate of enabling technologies) worked with Brandon in Tokyo to name and launch the new experiment--Free World Dialup.

3. What are all the Parts of this System?

- a. Free World Dialup Client, to run on the caller's machine.
- b. Free World Dialup Server, to run on the computers that link the Internet to local calling.
- c. Global Server, that will keep a list of all servers and the real-time status of each one.

4. What Platform(s) will this System run on?

The FWD client and server are now being developed for Windows 3.x. In the future, we would like to port the software to the Macintosh platform, but we need Mac developers to work with us on this. The Global Server will be designed to run on UNIX, and hopefully Windows NT and Linux in the future.

5. What is the Timeframe of this Project?

The Free World Dialup project was launched on October 17th. Alpha testing is currently underway. The first public Beta of this world-wide, free service is expected by Mid January.

We expect to open this service to the public in early 1996, after we build up a strong server network and iron out the bugs.

6. How is this Experiment Organized?

Jeff Pulver co-ordinates the project from his home in Great Neck, New York. We currently operate two mailing lists, one for general discussion and the other for software/hardware developers. You may sign up for the general list by sending email to majordomo@pulver.com and leaving the subject blank. Write in the body: subscribe free-world-dialup@pulver.com

In terms of administration, please see the next section.

7. Who is Coordinating the Experiment?

See our Project Team page.

8. What kind of participation do we need for the project?

a. Programmers

We particularly need Visual Basic developers with experience in TCP/IP. We also need UNIX developers for the Global Server portion of this project. We are also looking for Macintosh developers who will volunteer to port the Free World Dialup client software to the Mac platform.

b. Volunteer Servers

Anybody can become a server at little financial cost! And we need participation from all over the world. To become a server, you will need one connection to the Internet (either dedicated or dialup) and one separate phone line to patch calls to your local calling area. That means that if you are on a dialup connection to the Internet, you need a total of 2 phone lines. You will also need a Windows machine and sound card, as well as a voice modem which uses the Cirrus Logic chipset to patch through the calls. We will of course give you all the software for free.

c. Telecommunications Experts

We need assistance with everything from TCP/IP networking to information on legal/regulatory issues related to our effort. Please sign up if you have anything to contribute in this field!

d. Networkers

We need help in coordinating this global effort. Please help us by applying your networking abilities to this effort!

9. Where do I get a voice modem?

Please see the list of voice modems presently available.

10. How have phone companies reacted to this?

We have not had any response yet, although there was not really much telecom reaction to Internet Phone when it was released. Our emphasis is not on destroying telecommunications companies but rather on making it easier for normal people to communicate.

11. Is it illegal?

Because this experiment is for hobbyists in a non-commercial environment, we don't believe that we will encounter legal difficulties in the United States.

We do imagine that this project will raise eyebrows in several other countries, especially those that encourage and support telecommunications monopolies. It will be interesting to see how they react to this new development.

We are researching several legal and regulatory aspects of this project. If you would like to join in the debates, please make sure to sign up on the list!

12. Will the telecoms impede the Internet because of this project?

We are researching this fear, but we suspect that any trend towards unlimited calling will create a larger market for the telecom giants and that they will benefit handsomely from economies of scale, even at Internet prices.

Exhibit C

FOR IMMEDIATE RELEASE: MARCH 18, 1996

COALITION FORMED IN RESPONSE TO PHONE COMPANY ATTEMPTS TO BLOCK INTERNET SERVICES

New York, NY, March 18/PRNewswire/ - The "Voice On the Net" (VON) Coalition (<http://www.von.org/>) announces its formation in response to recent phone company attempts to regulate Internet services. The VON Coalition is taking action to preserve the worldwide network as a place for emerging technologies and business. Charter VON members include Internet users, technology companies and others intent on keeping the Internet open to all forms of electronic commerce, including voice transmission.

The issue of voice on the Internet has heated up in recent weeks. New technology advances have led to the availability of computer programs that allow people to carry on real-time voice conversations over the Internet. While Internet calls are not of the same high quality as those placed through traditional long distance services, they offer some compelling advantages. For example, using this technology, school children in a rural American community could easily and inexpensively communicate with a scientist in London. Their conversation could include video and drawings along with interactive voice transmission. A growing number of Internet voice products, including VocalTec Inc.'s (NASDAQ: VOCLF) Internet Phone and Quarterdeck's (NASDAQ:QDEK) WebTalk, can be purchased today. Other companies including Intel, Microsoft, and Netscape, have announced their intent to produce similar products.

The Long Distance industry, however, is trying to stop this competition. On March 4, ACTA, a trade association representing 130 of America's long distance companies, filed a petition asking the FCC to block the sale and use of such software products. ACTA is further asking that the FCC step in and begin regulating use of the Internet.

The VON Coalition, along with the majority of Internet users, vehemently opposes such regulation. Public notice of the ACTA petition was issued on March 8, 1996 by the FCC (Report No. 2124). Comments to the petition must be submitted to the FCC by April 8, 1996. The VON Coalition will take a lead role in opposing the ACTA filing.

"ACTA is, in effect, attempting to eliminate outside competition by banning emerging technologies" says VON Coalition Chairman Jeff Pulver. "The immediate mission of the VON Coalition is to persuade the FCC to deny the ACTA petition."

"The ACTA petition asks the FCC to 'define the type of permissible communication which may be effected over the Internet'", says Elon Ganor, Chairman & CEO of VocalTec, Inc. "This is the kind of regulation that the US government and people have traditionally criticized third world countries for."

"ACTA is asking that the FCC declare specific software companies as 'Telecom Carriers'", Ganor

continues. "Microsoft and Netscape recently announced audio and video strategies for the Internet. Does this mean they are now telecom carriers? Where will we draw the line?"

Howard Gordon, President of Xing Technologies, makers of the Streamworks audio and video streaming product, says his organization is strongly opposed to any efforts which limit the ability of content providers to develop alternative distribution channels.

"While the ACTA filing directly targets 2-way communications, we expect it's only a matter of time before similar efforts are directed against Internet radio and television broadcasting", says Gordon.

According to VON Coalition member Takeshi Utsumi, Ph.D., Laureate of the prestigious Lord Perry Award for Excellence in Distance Education, "The U.S. data communication networks such as ARPANET, Telenet (now SprintNet), and the Internet, have been unregulated since the early 1980s. The fact that these networks were unregulated allowed the use of email to successfully replace more expensive Telex communications."

Charter members of the VON Coalition include: VocalTec, Inc. (NASDAQ: VOCLF), Voxware Inc. , VDONet Corporation, Jabra Corporation, FreeTel Communications, Inc., The DSP Group (NASDAQ: DSPG), Insoft, White Pine Software, Netspeak Corporation, Xing Technology Inc., IDT Corporation, GLOSAS/USA and GU/USA, and Electric Magic Company.

Individuals and corporations interested joining the VON Coalition can visit the VON web site at <http://www.von.org/>. Anyone interested in submitting individual comments to the FCC may do so by writing to:

Federal Communications Commission
1919 M Street
Washington, DC 20554

All responses to the FCC should include a reference to Rulemaking No. 8775.
The FCC's website is <http://www.fcc.gov>.

-0- 3/18/96

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Exhibit D

MBONE

The MBONE is a critical piece of the technology that's needed to make multiple-person data, voice, and video conferencing on the Internet -- in fact, sharing any digital information -- cheap and convenient.

Internet researcher John December says, "MBONE is truly the start of mass-communication that may supplant television. Used well, it could become an important component of mass communication."

How so? December thinks that a number of scenarios are possible: The culture of the MBONE may develop like the e-zine (electronic magazine) culture, eventually giving rise to hundreds of "channels" of programming. Some channels would be professionally produced; others would be quirky homebrew channels.

Another possibility is that organizations will adopt MBONE as a low-cost way to conduct meetings without all the expenses of telecom-equipped conference rooms. Smaller, informal organizations could use MBONE as well as large companies, because MBONE would be controlled personally, not commercially. Certainly, both of these MBONE scenarios, and others, could co-exist.

What Is Multicasting?

Multicasting is a technical term that means that you can send a piece of data (a packet) to multiple sites at the same time. (How big a packet is depends on the protocols involved--it may range from a few bytes to a few thousand.) The usual way of moving information around the Internet is by using unicast protocols -- tools that send packets to one site at a time.

You can think of multicasting as the Internet's version of broadcasting. A site that multicasts information is similar in many ways to a television station that broadcasts its signal. The signal originates from one source, but it can reach everyone in the station's signal area. The signal takes up some of the finite available bandwidth, and anyone who has the right equipment can tune in. The information passes on by those who don't want to catch the signal or don't have the right equipment.

On a multicast network, you can send a single packet of information from one computer for distribution to several other computers, instead of having to send that packet once for every destination. Because 5, 10, or 100 machines can receive the same packet, bandwidth is conserved. Also, when you use multicasting to send a packet, you don't need to know the address

of everyone who wants to receive the multicast; instead, you simply "broadcast" it for anyone who is interested. (In addition, you can find out who is receiving the multicast -- something television executives undoubtedly wish they had the capability to do.)

How Is the MBONE Different from Multicasting?

Unfortunately, the majority of the routers on the Internet today don't know how to handle multicasting. Most routers are set up to move traditional Internet Protocol (IP) unicast packets -- information that has a single, specific destination. Although the number of routers that know how to deal with multicast are growing, those products are still in the minority.

Router manufacturers have been reluctant to create equipment that can do multicasting until there is a proven need for such equipment. But, as you might expect, it's difficult for users to try out a technology until they have a way to use it. Without the right routers, there's no multicasting. Without multicasting, there won't be the right routers. In 1992, the Internet Engineering Task Force (IETF) decided that what no one would do in hardware, they could do in software. So they created a "virtual network" -- a network that runs on top of the Internet -- and wrote software that allows multicast packets to traverse the Net. Armed with the custom software, these folks could send data to not just one Internet node, but to 2, 10, or 100 nodes. Thus, the MBONE was born.

The MBONE is called a virtual network because it shares the same physical media -- wires, routers and other equipment -- as the Internet. The MBONE allows multicast packets to travel through routers that are set up to handle only unicast traffic. Software that utilizes the MBONE hides the multicast packets in traditional unicast packets so that unicast routers can handle the information.

The scheme of moving multicast packets by putting them in regular unicast packets is called tunneling. In the future, most commercial routers will support multicasting, eliminating the headaches of tunneling information through unicast routers.

When the multicast packets that are hidden in unicast packets reach a router that understands multicast packets, or a workstation that's running the right software, the packets are recognized and processed as the multicast packets they really are. Machines (workstations or routers) that are equipped to support multicast IP are called mrouter (multicast routers). Mrouters are either commercial routers that can handle multicasting or (more commonly) dedicated workstations running special software that works in conjunction with standard routers.

Multicasting is a network routing facility -- a method of sending packets to more than one site at a time. The MBONE is a loose confederation of sites that currently implement IP multicasting.

What's on the MBONE?

Today, multicasting is used for videoconferencing, audioconferencing, shared collaborative workspaces, and more. Conference multicasts generally involve three types of media: audio, video, and a whiteboard -- a virtual note board that participants can share.

Perhaps the most sought-after function that the MBONE provides is videoconferencing. The MBONE originated from the Internet Engineering Task Force's attempts to multicast its meetings as Internet videoconferences. MBONE video is nowhere close to television quality, but at a few frames a second, video quality is good enough for many purposes.

In the spirit of the IETF's early technically-oriented offerings, many of the MBONE events that take place are technical conferences, ranging from the SIGGraph '94 conference in Orlando, Florida, to the International Conference on High Energy Physics in Glasgow, Scotland, to the Second International Conference on Intelligent Systems for Molecular Biology from Stanford University. Users also were able to tune into the MBONE to see astronauts on the space shuttle Endeavor repairing the Hubble space telescope and panel discussions at the 1995 annual meeting of the Congress of Neurological Surgeons.

The MBONE's capability to carry remote audio and video makes it a wonderful tool for seminars, lectures, and other forms of "distance education." Imagine sitting in on a lecture that's being given live thousands of miles away and even asking questions or contributing to a panel discussion.

According to Navy Lt. Tracey Emswiler, whose experiments with the MBONE are the basis for her master's thesis in information technology management, "Some people believe that teaching over the MBONE can't be done. We've proven that you can send regular live-broadcast lectures over the MBONE." An average of 10 to 12 universities and labs tune into each distance education lecture that is sent over the MBONE, including institutions in the United States, France, Great Britain, Japan and Germany.

Indeed, much of what happens today on the MBONE is of a technical nature, information that most of us would find dull. However, the nerds don't get to keep the MBONE to themselves. Besides esoteric engineering events, the MBONE is home to more exciting fare, such as multicasts of concerts, a do-it-yourself-radio station, and even poetry readings.

The Seattle-based techno-ambient band Sky Cries Mary performed the first live rock concert on the MBONE, and the Rolling Stones multicasted 20 minutes of their November 18, 1994, Dallas Cotton Bowl concert as a promotion for a subsequent pay-per-view TV special.

Radio broadcasts, in part because of their lesser bandwidth requirements, have become common on the MBONE. Some examples include episodes of "The Cyberspace Report" (a public-affairs show from KUCI 88.9 FM in Irvine, California), Internet Talk Radio, and Radio Free vat.

Some MBONE users are experimenting with distributing Usenet news via the MBONE instead of with NNTP (Net News Transport Protocol). NNTP has been used to pass netnews traffic around since the early days of Usenet, but sending Usenet traffic via multicasting could significantly reduce the total amount of bandwidth used to transmit netnews. Rather than having thousands of copies of a message travel from site to site, each message could be broadcast on the MBONE only once and grabbed by each site as it passes through.

How Large Is the MBONE?

Today, about 1,700 networks (in about 20 countries) are on the MBONE, making the MBONE approximately the size that the entire Internet was in 1990.

The size of the MBONE, compared to the Internet as a whole, is relatively small. As of February 1995, the Internet was home to 48,500 subnetworks. so the MBONE was available on roughly 3.5 percent of the Internet.

Pavel Curtis estimates that by 1996 or 1997, multicasting will be broadly supported in routers. When that happens, and upgraded routers are installed in place of unicast routers, the MBONE and the Internet will effectively be one entity.

Can Your Computer Handle the MBONE?

Although anyone who has the right equipment can use the MBONE, the hardware and connectivity requirements for using the MBONE are much greater than what's available on the equipment that most Internet users have in their homes. A PC or Macintosh system coupled with a standard modem doesn't have enough computing power or bandwidth to send or receive MBONE transmissions.

You need a good deal of power to handle multicast IP. Today, multicasting software -- the behind-the-scenes tools for moving, encoding, decompressing, and manipulating multicast packets -- is available only for high-end UNIX workstations, such as those from Sun, DEC, HP, IBM, and Silicon Graphics.

UNIX is a powerful, multitasking, multiuser operating system. UNIX was developed in 1969 by AT&T's Bell Laboratories, and today UNIX-based computers comprise a large portion of Internet-connected computers.

This situation is changing, however. Multicasting tools are becoming available for Linux -- a free UNIX-like operating system that runs on relatively cheap IBM PC-compatible computers. Since MBONE tools can work on a Linux-based PC, it's not too much to imagine that MBONE tools will soon be available for home computers -- PCs that are running Microsoft Windows and Macintosh computers. It will probably take the most powerful home computers (with Pentium and PowerPC chips), but it seems to be a likely eventuality. The software tools are being built: PC/TCP Version 2.3 from FTP Software Inc. supports multicasting for PCs, as does Windows 95, and it is rumored that the next version of MacTCP will support multicasting.

The ability to process multicast IP packets is one thing, but multicasting software is not much use without some multicast packets. Since the MBONE and Internet are not (yet) one and the same, before you can receive multicast packets, your network provider needs to get you hooked to the nearest MBONE node and to configure a "tunnel." This project should keep even expert network administrators busy for at least a week or two.

How Much Bandwidth Is Necessary?

Even if users had the hardware to do multicasting today, another huge hurdle would prevent the MBONE from taking over the Internet: Most users don't have enough bandwidth. A multicast

video stream of 1 to 4 frames per second eats about 128Kbps of bandwidth and gives you slow, grainy, bandwidth-hogging video. (By comparison, television-quality video scans at about 24 frames per second.) Remember though, that a video stream uses the same bandwidth whether it is received by 1 workstation or 100. Incidentally, 128Kbps is about nine times the speed of a 14.4Kbps modem. A dual-channel ISDN line can move data at 128Kbps, so if you are one of the lucky few who have ISDN, you have barely enough bandwidth to receive multicast video. (Sending video requires another 128Kbps, which makes using ISDN for two-way videoconferencing barely tolerable, if not impossible.) Most experts agree that in order to do multicasting effectively and get other work done, you need a T-1 or faster link to the Internet (although some users have managed to make the tools work with as little as 56Kbps). That 128K video stream uses nearly 10 percent of a T-1 line; several simultaneous high-bandwidth sessions can easily saturate network links

High-speed connections to the Internet can cost thousands of dollars a month. Lower-speed connections cost much less. The faster you go, the more you pay.

In their paper, "MBONE Provides Audio and Video across the Internet," authors Michael Macedonia and Donald Brutzman write, "Only a few years ago, transmitting video across the Internet was considered impossible. Development of effective multicast protocols disproved that widespread opinion. In this respect, MBONE is like the proverbial talking dog: It's not so much what the dog has to say that is amazing, it's more that the dog can talk at all!"

Audio multicasts, partly because of their lesser bandwidth requirements, are more common on the MBONE than are video multicasts. Multicast audio typically uses 56 to 64Kbps of bandwidth. (Thanks to heavy hacking and experimental compression tools, MBONE audio and interactive whiteboard traffic have been demonstrated by using as little as 9600 bps lines. These demonstrations are one indication that eventually those of us who access the Internet from home at 14.4Kbps will be able to have some access to the MBONE.)

"For the multicast broadcasting model that the MBONE establishes to succeed as a mainstream medium, current technologies simply have to advance," writes Internet guru Aaron Weiss. MBONE services simply eat more bandwidth than most of us can afford. Before multicasting becomes commonplace, either bandwidth needs to be available more cheaply, or our ability to compress bandwidth-hogging information into a limited bandwidth space needs to improve. "Network bandwidth has to fatten or audio-video compression schemes have to flatten," Weiss writes. "Presumably, both will occur, which also will require increased CPU power at the home computer level. Although it's probable that all three of these developments will take place, the time frame is not clear," he says.

Even if you could push 128 kilobits (or more) each second around the Internet affordably, it's a good bet that when enough of us could push that much data around that fast, the sheer load of all that data pulsing though the Internet would bring it to a standstill. One of the IETF's jobs is to plan for this eventuality.

"Until recently, experts believed that the MBONE could not be used for transmission of simultaneous video, audio, and data because of limited bandwidth," notes Professor Don Brutzman. "This effort to push the envelope of computing technology has provided valuable data to computer scientists and has shown that methods can be employed to work around the bandwidth problem."

There's a ceiling to the amount of information that can move around on the MBONE as a whole: 500Mbps (million bits per second). At full tilt, the MBONE itself can handle no more than four simultaneous videoconferencing sessions or eight audio sessions.

"Although there is much to experience on the MBONE, there isn't much space for everyone. There is only about 500Kbps of bandwidth available to the entire MBONE community at any one time. With video streams typically running at about 128Kbps and audio streams at 64Kbps, there is a small and finite limit on the number of simultaneous transmissions the MBONE can handle," writes Weiss.

This limited resource environment presents MBONE users with what Weiss calls "the classic sandbox scenario": sharing and playing nice. Sharing means planning multicast events in advance and scheduling them with the rest of the MBONE community to eliminate conflicts. Internet e-mail lists have been set up for announcing scheduled events.

Sometimes two planned events conflict (for example, a High Energy Physics conference conflicted with a planned IETF meeting, so the physics conference was broadcast at a later time). At times, oversight or naivete can wreak havoc. "In mid-1994, a host in Japan was found to have been sending 650Kbps video-streams over the entire MBONE, effectively trashing it," according to Weiss. The problem, as it turned out, was caused not by malice, but by a program bug that enabled the multicast packets to escape a local network. Such unintentional flooding happens periodically and is a testament to the experimental nature of the MBONE.

Who operates the MBONE?

No one is actually in charge of the MBONE's topography of event scheduling. Much like the Internet itself, the MBONE's growth has been based on mutual cooperation between network service providers and users.

The MBONE community is active and open. Work on tools, protocols, standards, applications, and events is a cooperative international effort. Cooperation is essential due to limited bandwidth on many networks (for example, on intercontinental links).

What Alternatives to the MBONE Are Available?

The MBONE shows promise for the future, but other tools are now available for using multimedia on the Internet. For example, CU-SeeMe is a videoconferencing tool for the Mac and PCs that works without the MBONE. CU-SeeMe uses reflectors -- computers that provide

the multipoint distribution functionality that multicasting would normally handle. Reflectors allow multiperson videoconferences without multicasting. Chapter 2 has more information on CU-SeeMe.

Multimedia on the Internet can also be handled by streaming technology software, which sends and receives an ongoing flow of information that can be interpreted and displayed (or heard) in real time. In this way, streaming technology software works like the MBONE; but this software does not use multicasting, and it does not require as much bandwidth as multicasting does. One example of streaming technology software is RealAudio, which is covered in Chapter 2.

John December believes that in order for MBONE and multicasting on the Internet to flourish, they must be allowed to continue their growth as they have been doing, "finding a niche from the ground up, according to the needs people have, rather than commercially introduced and presented and hyped by telecom companies." December points to the repeated failure of picture phones after more than three decades of hype by telecommunications companies. The MBONE has potential because it is controlled by the people, not by telecommunications companies.

Today, the MBONE offers users a certain degree of functionality as well as the opportunity to participate in and perhaps influence the gestation of a medium that will one day become predominant -- interactive multimedia multicast communications.

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MBONE-Multicasting Tomorrow's Internet <http://www.northcoast.com/savetz/mbone/>
The Unofficial Internet Book List
<http://www.northcoast.com/savetz/booklist>

Exhibit E

[SWISS OFCOM DECISION]

The characteristics of real-time two-way speech over the Internet are, at this time, distinguishable from those of the traditional telephone service: sound quality is poor, transmission delays can occur, there is saturation at peak times, etc. However, the Internet services are in the process of being optimized.

It cannot be ruled out that shortly, the Internet and the telephone service will be interconnected by means of special servers in order to enable long-distance communications. At such time, one could really speak of bypass of the telephone service monopoly of Swiss Telecom PTT.

At the present time, the act of verifying whether an Internet user employs his Internet access in order to transmit speech in real-time would necessitate disproportionate means, not to mention the legal and data protection implications. Acting against the Internet access provider by terminating the leased circuit subscription which serves as a basis for the provision of Internet access would also be disproportionate. The principal Internet applications used to-date (science, research, exchange of information, telematic experiments) would be unduly affected.

Internet is a network which permits world-wide information transmission at low prices. It is not in Switzerland's interests to give up the advantages which such a network can bring.

The remaining monopoly of Swiss Telecom PTT on the telephone service and on infrastructure will shortly expire. Consequently, draconian measures to preserve these exclusive rights are only adequate in case of very serious infringements.

Conclusion: at the present time, OFCOM sees insufficient reasons to intervene against the provision or the use of Internet speech transmission services. OFCOM monitors the situation and reserves its right to modify its policy in case the circumstances would change to a considerable extent.



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Telecom Info - Mailing

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Allgemeines - Informations générales

Sprachübertragung über Internet

Das Internet ist ein Datenübertragungsnetz, das seinen Ursprung in den USA hat, mittlerweile aber über die ganze Welt verbreitet ist. V.a. Universitäten im Rahmen von Forschungsprojekten, aber zunehmend auch andere Teilnehmer machen von der Möglichkeit des raschen und preiswerten Informationsaustausches regen Gebrauch. Das Netz besteht aus Komponenten von verschiedenen privaten und öffentlichen Netzen (PTT-Infrastruktur, Mietleitungen, private Knoten etc.).

Seit relativ kurzer Zeit kann in beschränktem Masse auch Sprache in Echtzeit über Internet übermittelt werden.

Der Benutzer bestellt über das Netz eine Software, installiert in seinem PC eine Voice Card, die bereits für andere Dienstleistungen zugelassen und auf dem Markt erhältlich ist, schliesst Lautsprecher und Mikrofon an und kann über Internet mit anderen Internet-Teilnehmern telefonieren.

Nun stellt sich die Frage, inwiefern diese Möglichkeit mit dem Telefondienst-Monopol der Telecom PTT kollidiert.

Der Telefondienst ist nach dem schweizerischen Fernmeldegesetz (FMG) definiert als Sprachübermittlung für Dritte zwischen festen und mobilen Teilnehmeranlagen. Dieser Dienst ist den PTT-Betrieben vorbehalten (Monopol). Gedacht hat der Gesetzgeber dabei hauptsächlich an die traditionelle feste Telefonleitung und ans Natel.

Die Sprachübertragung über Internet enthält zum jetzigen Zeitpunkt noch Komponenten, die sich vom traditionellen Telefondienst unterscheiden (insb. schlechtere Sprachqualität und Verzögerungen). Es besteht jedoch deutlich die Tendenz, den Dienst zu optimieren.

Möglicherweise sind diese schon bald mittels spezieller Servers Verbindungen zwischen dem Internet und dem öffentlichen Telefondienst möglich. Dann können über das Internet kostengünstige Ferngespräche in Telefonie-Qualität zwischen Teilnehmern am Internet und am öffentlichen Netz stattfinden (Nutzung der

Transmission de la parole par Internet

Internet, qui a vu le jour aux Etats-Unis mais dont les ramifications sont désormais mondiales, est un réseau de transmission de données. Il est l'outil privilégié des universités, qui s'en servent pour leurs projets de recherche, mais aussi de nombreuses autres usagers qui y trouvent un moyen rapide et avantageux de transmettre des informations. Il se compose lui-même de divers réseaux privés et publics (infrastructures PTT, circuits loués, noeuds privés etc.)

Depuis peu, Internet permet également, dans une mesure restreinte, de transmettre de la parole en temps réel.

L'utilisateur obtient le logiciel nécessaire par le réseau, installe dans son PC une Voice Card déjà agréé pour d'autres services et disponible sur le marché, branche haut-parleur et microphone, et le voici prêt à téléphoner avec d'autres usagers d'Internet.

Il s'agit dès lors d'examiner dans quelle mesure cette technique entre en conflit avec le monopole de Télécom PTT sur le service téléphonique.

Selon la loi suisse sur les télécommunications (LTC), le service téléphonique est défini comme la transmission de la parole destinée à des tiers, entre des installations d'usagers fixes ou mobiles. Ce service fait partie du monopole de l'Entreprise des PTT. A cet égard, le législateur pensait surtout aux classiques lignes de téléphone fixes ainsi qu'au système Natel.

Pour l'heure, certaines caractéristiques de ce service de transmission de la parole le distinguent encore du service téléphonique traditionnel: qualité sonore médiocre, délais de transmission, etc). Cependant, ce service est clairement en voie d'optimisation.

Il n'est pas à exclure que sous peu, Internet et le service de téléphone public seront reliés grâce à des serveurs spéciaux. Les usagers d'Internet et du réseau public pourraient alors effectuer des appels longue distance en qualité téléphonique (utilisation de l'infrastructure du réseau de téléphone public pour les courtes

Infrastruktur des öffentlichen Telefonnetzes im Nahbereich, Umachaltung auf das Internet für Fernverbindungen). Spätestens dann kann von einer Umgehung des Telefondienstmonopols der PTT-Betriebe gesprochen werden.

Aufgrund bisheriger Abklärungen kommen wir zum Schluss, dass im heutigen Stadium eine Überprüfung der Internetanschlüsse daraufhin, ob auch Sprache in Echtzeit übertragen wird, unverhältnismässig und datenschutzrechtlich problematisch wäre. Auch die Sanktion von auffälligen Verstössen mit dem Widerruf der Mietleitungen, die dem Internet zugrunde liegen, wäre unverhältnismässig. Die bisherigen Hauptanwendungen des Internet (Wissenschaft, Forschung, Informationsaustausch, Telematikversuche) würden ungebührlich betroffen.

Das Internet ist ein Netz, das zur kostengünstigen Übertragung von Daten weltweit genutzt werden kann. Die Schweiz hat kein Interesse daran, auf die Annehmlichkeiten, die dieses Netz bietet, zu verzichten.

Zumindest zum jetzigen Zeitpunkt sind einer rasanten Entwicklung von Telefondiensten auf dem Internet Grenzen gesetzt, da das Netz zu Stosszeiten heute schon Kapazitätsengpässe kennt.

Das Ende der noch bestehenden nationalen Monopole der Telecom PTT auf Telefondienst und Infrastruktur ist in Sicht. Folgenschwere Massnahmen zum Schutz dieser Rechte sind deshalb nur bei entsprechend folgenschweren Widerhandlungen angebracht.

Fazit: Zum jetzigen Zeitpunkt fühlt sich das BAKOM nicht veranlasst, Massnahmen gegen das Angebot oder den Gebrauch von Sprachübertragung über Internet zu ergreifen. Es verfolgt jedoch die Entwicklungen in diesem Bereich aufmerksam und behält sich vor, seine Haltung zu überprüfen, falls sich die Situation erheblich ändern sollte.

Wieder einmal zeigt sich deutlich, dass die heutigen rechtlichen Grundlagen im Fernmeldebereich nicht mehr genügen. Eine Revision des FMG ist denn auch im Gang.

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distances, Internet pour les longues distances). Dès lors, on pourra véritablement parler de contournement du monopole de l'Entreprise des PTT sur le service téléphonique.

Ce bref exposé nous permet de conclure qu'à l'heure actuelle, le fait de vérifier si un usager d'Internet se sert de son branchement pour transmettre également de la parole en temps réel impliquerait des moyens disproportionnés, sans parler des problèmes juridiques liés à la protection des données. Sanctionner d'éventuels abus en résiliant le circuit loué qui sert de base à Internet serait également disproportionné. Les applications principales d'Internet utilisées jusqu'à présent (science, recherche, échange d'informations, essais de télématique) en seraient indûment affectées.

Internet est un réseau qui permet, à des frais réduits, de transporter des informations dans le monde entier. La Suisse n'a aucun intérêt à renoncer aux avantages que représente un tel réseau.

Pour l'instant tout au moins, l'évolution rapide des services téléphoniques sur Internet se heurte à des obstacles, car aujourd'hui déjà, le réseau est saturé aux heures de pointe.

Quant à ce qui reste du monopole national de Telecom PTT sur le service téléphonique et l'infrastructure, la fin s'approche. Par conséquent, des mesures draconiennes pour préserver ces droits ne sont adéquates que dans le cas d'infractions très graves.

Conclusion: à l'heure actuelle, l'OFCOM n'a pas de raison suffisante d'intervenir contre le fait d'offrir ou d'utiliser un service de transmission de la parole par Internet. Il suit cependant la situation de près et se réserve le droit de changer de politique si les circonstances valent considérablement changer.

Une fois de plus, nous constatons que dans le domaine des télécommunications, les bases juridiques ne sont plus suffisantes. Une révision de la LTC est actuellement en préparation.

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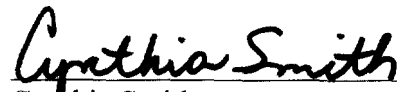
CERTIFICATE OF SERVICE

I, Cynthia Smith, a secretary to the law firm of Fisher Wayland Cooper Leader & Zaragoza L.L.P., hereby certify that on this 8th day of May, 1996, I served a true copy of the foregoing "Opposition of the VON Coalition" by first class United States Mail, postage prepaid, upon the following:

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